

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

## PCT

To:

see form PCT/ISA/220

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**  
(PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/JP2004/008407

International filing date (day/month/year)  
09.06.2004

Priority date (day/month/year)  
19.06.2003

International Patent Classification (IPC) or both national classification and IPC  
G21G4/04

Applicant  
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**1. This opinion contains indications relating to the following items:**

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

**2. FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

**3. For further details, see notes to Form PCT/ISA/220.**

Name and mailing address of the ISA:



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**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**International application No.  
PCT/JP2004/008407

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**Box No. I Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.  
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:  
☐ a sequence listing  
☐ table(s) related to the sequence listing
  - b. format of material:  
☐ in written format  
☐ in computer readable form
  - c. time of filing/furnishing:  
☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/JP2004/008407

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**Box No. II    Priority**

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1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. ☐ It has not been possible to consider the validity of the priority claim because a copy of the priority document was not available to the ISA at the time that the search was conducted (Rule 17.1). This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.
4. Additional observations, if necessary:

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**Box No. V    Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	1-11
	No: Claims	12-14
Inventive step (IS)	Yes: Claims	1-11
	No: Claims	12-14
Industrial applicability (IA)	Yes: Claims	1-14
	No: Claims	

2. Citations and explanations

**see separate sheet**

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement.

1. Reference is made to the following documents:

D1: XP8035233

D2: GB-A-636338

2. Claims 12-14

- 2.1 The subject-matter of claims 12-14 is not new (Art.33.2 PCT).

The document D1 discloses (see fig. 2,3):

a  $^{210}\text{Pb}$  collector which uses radon collection for collecting  $^{210}\text{Pb}$ - $^{210}\text{Po}$ , which comprises a  $^{222}\text{Rn}$  source which includes a substance including uranium radioactive nuclides; a moisture trap for collecting  $^{222}\text{Rn}$  gas generated by the  $^{222}\text{Rn}$  source along with a carrier gas and sending pure radon gas to a cold trap; and a  $^{222}\text{Rn}$  collector trap for liquefying the  $^{222}\text{Rn}$  gas by cooling to a temperature below the boiling point of  $^{222}\text{Rn}$  and then generating  $^{210}\text{Pb}$  and  $^{210}\text{Po}$ .

- 2.2 Further, D1 discloses an assembly showing all the additional features of dependent claims 13-14, which therefore are not new.

3. Claims 1-11

- 3.1 The subject-matter of claims 1-11 is new and inventive (Art.33.2 and Art.33.3 PCT).

The document D2 (see page 2, lines 86-119), which is considered as the closest prior art, discloses:

a method for making thin radioactive alpha sources, which consists of homogeneously mixing finely-divided radioactive (such as radium) powders with metal (such as gold) powders, sintering and compacting by rolling, sandwiching the mass between layers of protective metal, and cold working to the desired size. The proportions of radioactive powder and metal powder depend upon how intense a degree of radioactivity is desired in a given final volume.

The subject-matter of claim 1 differs from this known method in that a pure

$^{210}\text{Pb}$ - $^{210}\text{Po}$  hydroxide precipitate is obtained by chemical treatment of a precursor  $^{222}\text{Rn}$  source. The precipitate is then dissolved to obtain a final  $^{210}\text{Pb}$ - $^{210}\text{Po}$  thin film.

- 3.2 The problem to be solved is how to manufacture an alpha source without the necessity of controlling the density of the alpha emitter, sandwiched between metal cover members or mixed in a metal matrix, which requires special dedicated apparatuses, for obtaining the desired activity in a given volume (see description, page 2, lines 7-18).

Independent claim 1, which relates to a method for producing a sealed  $^{210}\text{Pb}$ - $^{210}\text{Po}$  alpha source by using the Pb/Po powders of claim 12, discloses the feature of precipitating the hydroxides of the Pb/Po collected in the collector of claim 12, collecting the precipitates using a polycarbonate filter, dissolving the hydroxide precipitates to form a Pb/Po radioactive thin film and sealing the thin film for protection.

This solution is neither known from, nor rendered obvious by the available prior art.

- 3.3 Claims 2-11 are dependent on claim 1 and, as such, they also meet the requirements of the PCT with respect to novelty and inventive step.